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FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OH  
A METHOD FOR MANUFACTURING CYLINDRICAL GRATINGS, (U)  
MAR 82 V I YEREMIN, S I DENISOV  
FTD-ID(RS)T-0133-82

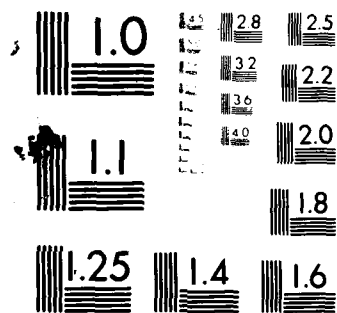
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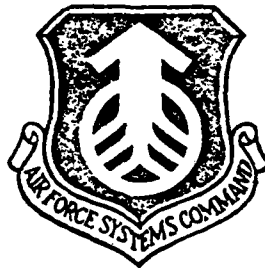
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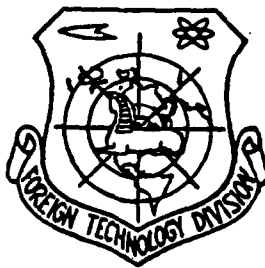
# FOREIGN TECHNOLOGY DIVISION



A METHOD FOR MANUFACTURING CYLINDRICAL GRATINGS

by

V.I. Yereimin, S.I. Denisov, et al



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## EDITED TRANSLATION

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A METHOD FOR MANUFACTURING CYLINDRICAL GRATINGS

By: V.I. Yeremin, S.I. Denisov, et al

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# U. S. BOARD ON GEOGRAPHIC NAMES TRANSLITERATION SYSTEM

Block	Italic	Transliteration	Block	Italic	Transliteration
А а	<i>А а</i>	A, a	Р р	<i>Р р</i>	R, r
Б б	<i>Б б</i>	B, b	С с	<i>С с</i>	S, s
В в	<i>В в</i>	V, v	Т т	<i>Т т</i>	T, t
Г г	<i>Г г</i>	G, g	У у	<i>У у</i>	U, u
Д д	<i>Д д</i>	D, d	Ф ф	<i>Ф ф</i>	F, f
Е е	<i>Е е</i>	Ye, ye; E, e*	Х х	<i>Х х</i>	Kh, kh
Ж ж	<i>Ж ж</i>	Zh, zh	Ц ц	<i>Ц ц</i>	Ts, ts
З з	<i>З з</i>	Z, z	Ч ч	<i>Ч ч</i>	Ch, ch
И и	<i>И и</i>	I, i	Ш ш	<i>Ш ш</i>	Sh, sh
Й й	<i>Й й</i>	Y, y	Щ щ	<i>Щ щ</i>	Shch, shch
К к	<i>К к</i>	K, k	Ъ ъ	<i>Ъ ъ</i>	"
Л л	<i>Л л</i>	L, l	Ы ы	<i>Ы ы</i>	Y, y
М м	<i>М м</i>	M, m	Ь ь	<i>Ь ь</i>	'
Н н	<i>Н н</i>	N, n	Э э	<i>Э э</i>	E, e
О о	<i>О о</i>	O, o	Ю ю	<i>Ю ю</i>	Yu, yu
П п	<i>П п</i>	P, p	Я я	<i>Я я</i>	Ya, ya

\*ye initially, after vowels, and after ъ, ы; e elsewhere.  
When written as ё in Russian, transliterate as yë or ë.

## RUSSIAN AND ENGLISH TRIGONOMETRIC FUNCTIONS

Russian	English	Russian	English	Russian	English
sin	sin	sh	sinh	arc sh	sinh <sup>-1</sup>
cos	cos	ch	cosh	arc ch	cosh <sup>-1</sup>
tg	tan	th	tanh	arc th	tanh <sup>-1</sup>
ctg	cot	cth	coth	arc cth	coth <sup>-1</sup>
sec	sec	sch	sech	arc sch	sech <sup>-1</sup>
cosec	csc	csch	csch	arc csch	csch <sup>-1</sup>

### Russian English

rot	curl
lg	log

A METHOD FOR MANUFACTURING  
CYLINDRICAL GRATINGS

V. I. Yeremin, S. I. Denisov,  
V. T. Arsent'yev, and V. M.  
Korel'skiy.

This invention pertains to the area of opticomemchanical industry. At the present time, metallic gratings are being manufactured by milling or slotting the openings using a low-yield pressure technique. However, in this case, the subsequent machining operation does not ensure the exactness of the dimensions and surface finish of the cutting edges of the grating, since the connecting pieces are deformed and burrs and chips are formed on the cutting edges of the grating requiring the finishing gage work for their elimination.

In order to improve the preciseness of the dimensions of the grating elements, their surface finish, and to reduce the amount of work, the method being proposed calls for a circular groove to be cut on the internal surface of the grating, the use of a mandrel whose diameter is less than that of the internal surface of the grating, the clearance to be filled with a fusible alloy, teeth to be cut without removing the mandrel by means of gear generation simultaneously on the cylindrical part of the grating and the alloy, and then the alloy and mandrel to be removed by heating.

To ensure a closer fit of the alloy to the surface of the grating and mandrel, the grating is heated to the fusing temperature of the alloy before the clearance is filled with the alloy.

The procedure is as follows.

The grating blank having the form of a cylindrical ring is degreased with benzine or acetone.

The mandrel (plug), whose diameter is smaller than the internal diameter of the grating, is placed inside the grating. A fusible composition, for example - Wood's alloy, is poured into the clearance between the mandrel and the inner surface of the grating. After the fusible composition hardens, teeth are cut in the cylindrical part of the grating and in the layer of the fusible composition simultaneously by means of gear generation. Then the fusible composition is eliminated by melting and the mandrel is removed. This leaves closed through holes in place of the fusible composition on the cylindrical part of the grating, which alternate with the connecting pieces because the cylindrical part of the grating is formed into a rim of a toothed, for example spur-gear, wheel in which a groove is cut on the inner side of the blank along the middle. The diameter of this groove is equal to that of the diving circumference. i.e., the tooth roots are cut. It is this groove that is filled with the fusible composition, which prevents the connecting pieces formed during the cutting of teeth from deforming and eliminates the undesirable vibrations. At the same time, this prevents the formation of burrs and chips on the working edges of holes since the process of cutting teeth, in this case, proceeds similarly to the process of cutting in the entire (without the groove) material. In order for the hobbing or mortising cutter not to cut the mandrel placed inside the grating, the size of the clearance between the mandrel and the internal surface of the grating must be greater than the height of the root of the tooth by 1-3 mm.

#### **Patent Claims**

1. The method for manufacturing cylindrical gratings with primarily rectangular closed holes by their machining is different in that to improve the preciseness of the dimensions of the grating elements, their surface finish, and to shorten the process, a circular groove is cut in the internal surface of the grating, a mandrel is used whose diameter is less than the internal surface of the grating, the clearance is filled with a fusible alloy, teeth are cut without removing the man-

drel by means of gear generation simultaneously on the cylindrical part of the grating and the alloy, and then the alloy and the mandrel are removed by heating.

2. The method described in paragraph 1 is distinguished by the fact that to ensure a closer fit of the alloy to the surface of the grating and mandrel, the grating is heated to the fusion temperature of the alloy before the clearance is filled.



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